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A NORMATIVE PROPOSAL FOR THE FIGURES OF THE PROTONCONCH OF GASTROPODS (**)

KEY WORDS: Gastropods, protoconch, SEM photographs.

Abstract

A normative for the illustration of the protoconch of gastropods mainly through SEM method is proposed. Two different images should be presented: one taken vertically and a second taken laterally. In the particular case of the heterostrophic protoconchs, these views should be presented with specific orientations. This normative enables the comparaison between illustrations by different authors.

Riassunto

Si propone una normativa per eseguire illustrazioni delle protoconche di gasteropodi, soprattutto nel caso di riprese SEM. Devono essere effettuate due diverse immagini, una ripresa dall'alto, una seconda di fianco. Nel caso particolare di protoconche eterostrofiche, le fotografie devono essere eseguite con determinati orientamenti. Con questa normativa è possibile fare confronti fra illustrazioni eseguite da autori diversi.

The use of the Scanning Electron Microscope (SEM) in the study od the protoconch of Gastropods has become general over the last decades. This has produced a very important quantity of information of enormous value, due to the great power of resolution and depth of field of this instrument. At present, and as part of the normal practice, many studies related to this group of organisms are accompanied by photographs of the protoconch taken by the SEM. One can affirm that new perspectives have been opened up in the study of certain fields due to the type of information gained from this medium. One may cite the cases of taxonomy or biogeography. In other areas of scientific research, such as those referring to ecology, phylogeny or macroevolution, completely new perspectives have been opened.

Yet, in spite of this abundance of images, the dregree of scientific output obtained is lower than expected. This is due to the complete lack of uniformity in the orientation of the shells.

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It is common to find illustrations which do not expose all the elements necessary for a complete or correct comprehension of the morphology of protoconch by the observer. As a result of this, at times it is impossible to compare the images of certain authors with those of others or with own observations. Even in cases the different images contained in the same study.

We belive it would be convenient to arrive at some type of consensus regarding the orientation of the protoconches in the photographs of the SEM which would permit a total, correct and direct interpretation of the images avoiding any ambiguity. This normative would have to guarantee the presence of all the information necessary for the study of the protoconch in the image. Bearing this in mind, we propose the following.

We believe that at least two different images of the same protoconch should be presented:

— First, one image taken vertically (in the direction of the shell axis) in which one may observe nucleus form, the horizontal development of the spiral, and which allows the counting of whorls (Fig. 1A).
— Second, one image taken laterally (perpendicular to the shell axis) which contains the transitional zone between the protoconch and the teleoconch; within which various features may be appreciated, such as nucleous prominence, the vertical growth of the spiral, whorl convexity, suture type and the initial ontogeny of the teleoconch (Fig. 1B).

Facultatively, other images may be presented. In particular, an image of the protoconch with the axis inclined at an angle between 25 and 35 degrees. This should allow the observation of the transition and allows a very good idea of the whole. Yet always bearing in mind that this image alone does not contribute sufficient data. In certain species it may be convenient to add images with greater magnifications of the details of ornamentation, or of some other characteristic feature. Moreover, these should never substitute the two basic images (vertical and lateral).

In the case of the heterostrophic protoconchs the number of photographs presented should also be two but with specific orientations:

— One taken in the direction of the coiling axis of the protoconch, providing observation of horizontal development (Fig. 2A).
— One taken in the direction of the axis of the teleoconch, in which one can observe the change in direction of the coiling and the beginning of the teleoconch (Fig. 2B).

It is possible that in the case of some taxonomic groups a specific orientation will be necessary. In these cases one must define which are the basic necessary images.

With reference to the magnifications, this is a secondary aspect that will depend on the dimensions of the protoconch in question. The scale which must be present will allow a valid approximation of the size of the specimen.

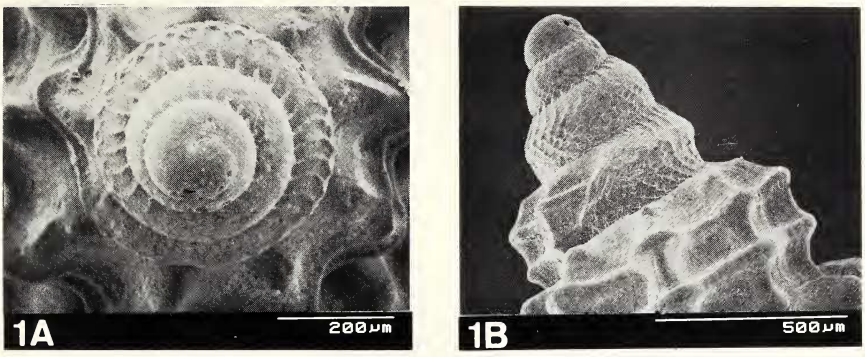

Fig. 1 - Homostrophic protoconch. *Mangelia quadrillum* (Dujardin, 1837). Lower Pliocene. Can Albareda (Baix Llobregat, Catalonia, NE Spain).
A. Axial view; B. Lateral view.

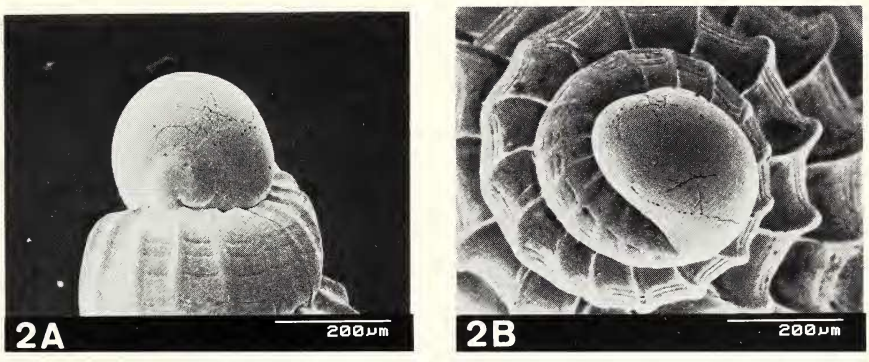

Fig. 2 - Heterostrophic protoconch. *Turbonilla scalaris* (Philippi, 1836). Recent. L'Estartit (Baix Empordà, Catalonia, NE Spain).
A. Axial view of the protoconch; B. Lateral view of the protoconch (axial of the teleoconch).

Generally speaking, getting the basic proposed images requires an adequate mounting of the specimen on the stub. In addition, we have found that it results very practical to align as far as possible the axis of the shell with the geometric centre of the stub. However this will depend a great deal on the type of SEM used, on its orientation capacity, working distance, etc.

It is not infrequent to find a specimen which serves to provide photographs of the prococonch yet which is of no more use to us for any other type of image. On the contrary, often it is not possible to take photographs of the proconch with the correct orientation with specimens which have previously been mounted to take photographs of the teleoconch.

All that has been said regarding the orientation of the protoconch with the SEM, should also be applicable in the same way to the use of the lucid chamber with the steromicroscope to produce drawings.

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